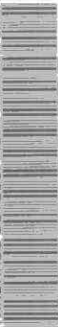


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Drinking Water Surveillance Program

FORT ERIE WATER TREATMENT PLANT

Annual Report 1987

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**Environment
Ontario**

Jim Bradley, Minister

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FORT ERIE
WATER TREATMENT PLANT

DRINKING WATER SURVEILLANCE
PROGRAM

ANNUAL REPORT 1987

ONTARIO MINISTRY OF ENVIRONMENT
OCTOBER 1988

ACKNOWLEDGEMENTS

The Drinking Water Surveillance Program (DWSP) employs a team approach requiring the co-operative effort of the Ministry of the Environment (MOE) staff from Water Resources and Laboratory Services Branch and the Regions, as well as plant operational staff from the Municipalities.

This annual report was produced by the DWSP Group (Ron Hunsinger, Peter Bohm, Carol Sackville-Duyvelshoff, Chris Fung and John McGrachan) and by Pat Lachmaniuk (on developmental assignment to the Drinking Water Section).

Helpful input and reviews were received from Drinking Water Section Staff, in addition to reviews by other MOE and municipal personnel.

EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

FORT ERIE WATER TREATMENT PLANT 1987 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored.

The Fort Erie Water Treatment Plant is a conventional treatment plant which treats water from Lake Erie. The process consists of coagulation, flocculation, sedimentation, filtration and disinfection. This plant serves a population of approximately 25,000 people and has a design capacity of 50 x 1000m³/day.

Water samples from the raw, treated and two distribution sites were taken on a monthly basis and analyzed for approximately 160 parameters, 9 times during 1987. Parameters were divided into the following groups Bacteriological, Inorganic and Physical (Laboratory Chemistry, Field Chemistry and Metals) and Organics (Chloroaromatics, Chlorophenols, Pesticides and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles). Specific Pesticides and Chlorophenols were analysed for in November only.

A summary of results is shown in Table 1.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of the water; however routine bacteriological monitoring as recommended in the Ontario Drinking Water Objectives (ODWOs) is carried out by the operating authority. Fecal Coliforms were present in one sample in the distribution system. In terms of the limited DWSP bacteriological examination the water was of good quality.

Inorganic and Physical parameters (Laboratory Chemistry, Field Chemistry and Metals) were below any applicable health related ODWOs.

Of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

Many of the substances detected are naturally occurring or treatment by-products.

During 1987 the DWSP sampling results indicated that the Fort Erie Water Treatment Plant produced good quality water at the plant and this quality was maintained throughout the distribution system.

SOMMAIRE

PROGRAMME DE SURVEILLANCE DE L'EAU POTABLE

STATION D'ÉPURATION DE L'EAU DE FORT ERIE

RAPPORT ANNUEL 1987

Le Programme de surveillance de l'eau potable (PSEP) de l'Ontario fournit des informations immédiates, fiables et à jour sur la qualité de l'eau potable. Le PSEP a débuté officiellement en avril 1986. Il est destiné à englober tous les réseaux municipaux d'alimentation en eau de l'Ontario. Actuellement, 44 stations en font partie.

La station d'épuration de Fort Erie est une station classique qui traite l'eau du lac Érié. Le traitement comporte la coagulation, la floculation, la décantation, la filtration et la désinfection. Cette station dessert une population d'environ 25 000 habitants et a une capacité nominale de 50 x 1 000 m³/jour.

Des prélèvements d'eau brute et d'eau traitée ainsi qu'en deux points du réseau de distribution ont été effectués chaque mois. Neuf fois en 1987, ces prélèvements ont été analysés par rapport à environ 160 paramètres dans les catégories suivantes : bactériologique, inorganique et physique (analyses en laboratoire et sur place, présence de métaux) et organique (composés aromatiques chlorés, chlorophénols, pesticides et BPC, dérivés phénoliques, hydrocarbures aromatiques polynucléaires, pesticides particuliers et composés volatils). Les chlorophénols et les pesticides particuliers n'ont été analysés qu'en novembre.

Le tableau 1 résume les résultats obtenus.

En raison de la fréquence des prélèvements (un par mois), le PSEP ne permet pas d'évaluer tous les aspects de la qualité bactériologique de l'eau. Cependant, comme on le recommande dans le cadre des objectifs relatifs à la qualité de l'eau potable en Ontario, un contrôle bactériologique est effectué par l'exploitant. Des coliformes fécaux étaient présents dans un des échantillons du réseau de distribution. L'analyse bactériologique limitée du PSEP a révélé une eau de bonne qualité.

Les mesures des paramètres inorganiques et physiques étaient inférieures aux limites applicables fixées par l'Ontario pour l'eau potable.

Pour environ 110 paramètres organiques mesurés chaque mois, aucun résultat n'a dépassé les limites acceptables fixées pour la santé.

Un grand nombre de substances détectées apparaissent naturellement ou sont des produits dérivés de l'épuration.

Les résultats des analyses effectuées en 1987 dans le cadre du PSEP ont indiqué que la station d'épuration de Fort Erie donnait une eau de bonne qualité et que cette qualité se maintenait dans tout le réseau de distribution.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE BY SCAN (1987)

SCAN	RAW			TREATED			SITE 1			SITE 2			SITE 3		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	20	17	85	24	6	25	36	12	33	17	9	52	13	4	30
CHEMISTRY (FLD)	15	15	100	36	36	100	74	74	100	27	27	100	8	8	100
CHEMISTRY (LAB)	95	71	74	114	77	67	280	234	83	99	82	82	65	55	84
METALS	100	47	47	105	48	45	299	156	52	117	56	47	79	39	49
CHLOROAROMATICS	65	0	0	52	0	0	91	0	0	26	0	0	26	0	0
CHLOROPHENOLS	6	0	0	6	0	0	.	.	.	.	.	.	.	.	.
PAH	34	0	0	34	0	0	.	.	.	.	.	.	.	.	.
PESTICIDES & PCB	125	0	0	106	0	0	179	0	0	53	0	0	49	0	0
PHENOLICS	5	0	0	6	0	0	.	.	.	.	.	.	.	.	.
SPECIFIC PESTICIDES	63	0	0	72	0	0	81	0	0	27	0	0	18	0	0
VOLATILES	140	0	0	168	25	14	225	34	15	84	12	14	57	9	15
TOTAL	668	150		723	192		1265	510		450	186		315	115	

FECAL COLIFORMS WERE PRESENT IN ONE DISTRIBUTED WATER. NO OTHER HEALTH RELATED GUIDELINES/LIMITS WERE EXCEEDED.

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
 A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

FORT ERIE WATER TREATMENT PLANT 1987 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored. Appendix A contains a detailed description of the DWSP.

The DWSP was initiated at the Fort Erie Water Treatment Plant in February of 1987 but was not completely on line until June.

This report contains information and results for 1987.

PLANT DESCRIPTION

The Fort Erie Water Treatment Plant is a conventional treatment plant which treats water from Lake Erie. The process consists of coagulation, flocculation, sedimentation, filtration and disinfection; powdered activated carbon is used for taste and odour control when necessary. This plant serves a population of approximately 25,000 people. It has a design capacity of 50 x

1000m³/day and daily flows ranging from 16 x 1000m³/day to 34 x 1000m³/day.

The plant location is shown in Figure 1. Plant Process details, in a block schematic, are shown in Figure 2. General plant information is presented in Table 2.

METHODS

Water samples were obtained from four DWSP approved locations;

- i) Plant Raw - The water originated from the lowlift discharge prior to chlorination and was sampled through a stainless steel line. The sample tap is located near the lowlift well.
- ii) Plant Treated - The water originated from the highlift discharge after addition of all treatment chemicals and was sampled through a stainless steel sample line. The sample tap is located near the highlift pumps.
- iii) Distribution System - Site 1 - This house is approximately 4.1 kilometers from the plant. Water was sampled through copper plumbing from the basement laundry tap.
- iv) Distribution System - Site 2 - This house is approximately 10 kilometers from the plant. Water was sampled through copper plumbing from the kitchen sink tap.

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

SITE LOCATION MAP

LOCATION: FORT ERIE WATER TREATMENT PLANT

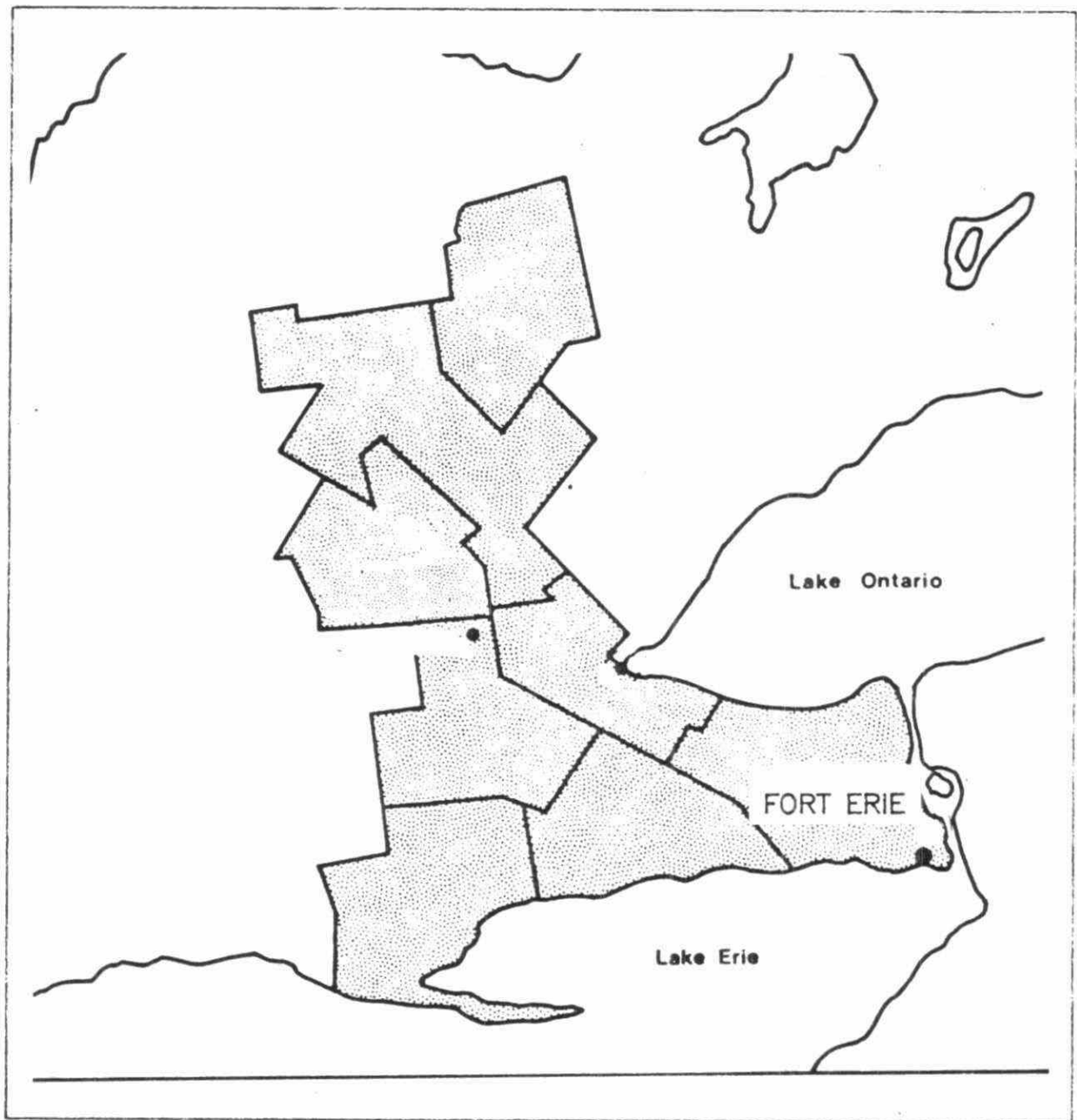


Figure 2

FORT ERIE(ROSE HILL) WATER TREATMENT PLANT

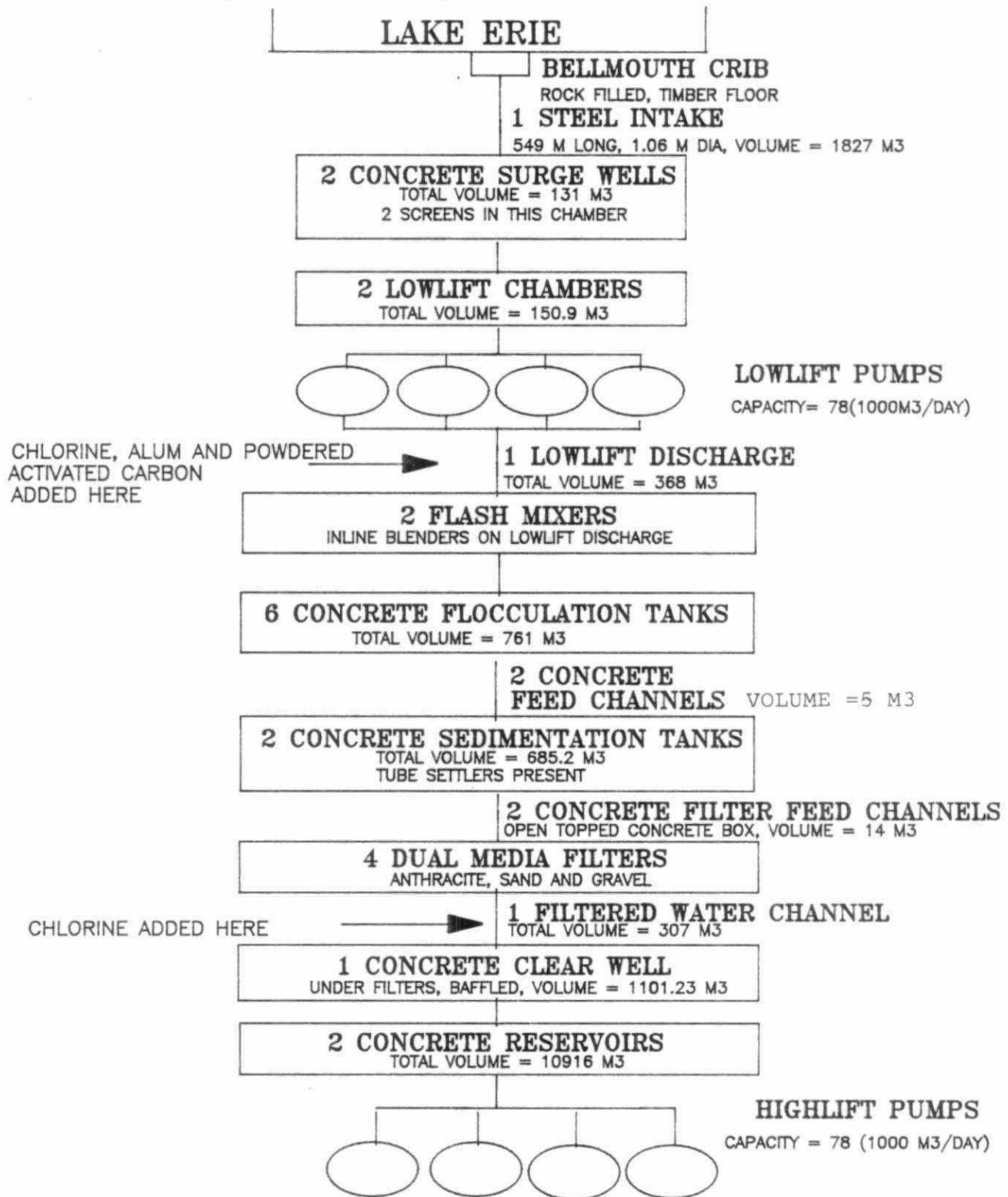


TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

FORT ERIE WATER SUPPLY SYSTEM

<u>LOCATION:</u>	ROSEHILL ROAD FORT ERIE, ONTARIO (416-871-3551)
<u>SOURCE:</u>	RAW WATER SOURCE - LAKE ERIE
<u>RATED CAPACITY:</u>	50 (1000 M3/DAY)
<u>OPERATION:</u>	MUNICIPAL
<u>PLANT SUPERINTENDENT:</u>	MR. H. HODGSON
<u>MINISTRY REGION:</u>	WEST CENTRAL
<u>DISTRICT OFFICER:</u>	MR. J. MAYES

<u>MUNICIPALITY SERVED</u>	<u>POPULATION</u>
FORT ERIE	25,000

A third Site was originally scheduled to be sampled but was discontinued in March after only two samplings.

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

At both distribution system locations two types of samples were obtained: a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples are used to make an assessment of the amount by which the levels inorganic compounds may be changed on standing due to leaching from (or deposition on) the plumbing system. The only analyses carried out on these samples therefore, are General Chemistry and Metals. The free flow sample represented fresh water from the distribution main that had been flowing for five minutes before being sampled.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. The retention time was calculated by dividing the volume of water between the two sampling points by the sample day flow. For example, if it was determined that the retention time within the plant was five hours then there would be a five hour interval between the raw and treated sampling. Similarly if it was estimated that it took approximately one day for the water to

travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

Stringent DWSP sampling protocols were followed to eliminate any variance (Appendix B).

Sample day flow, treatment chemical dosages and Field Chemistry measurements were recorded on the day of sampling and were entered on the DWSP database as submitted.

RESULTS

Water at the Fort Erie Water Treatment Plant was sampled for approximately 160 parameters on a monthly basis nine times. The lowlift pump was down for repairs in December, thus no samples were taken for the raw water. The Specific Pesticides and Chlorophenols scans were sampled for in November only.

Polynuclear Aromatic Hydrocarbons and Phenolics were only analysed for in the raw and treated water at the plant.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed for by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 presents parameters not detected.

Associated guidelines and detection limits are also supplied on both tables. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently initiated by the MOE catalogues and keeps current over 1750 guidelines for 650

parameters from agencies throughout the world.

As stated under Results, traces do not indicate quantifiable values, as defined by established MOE Laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.

Bacteriology

Positive results for the Bacteriology scan were present six times in the treated water, twelve times in the distribution system Site 1 water, nine times in the Site 2 water and four times in the Site 3 water. The positive parameters were Standard Plate Count, Total Coliform and/or Total Coliform Background and the Presence/Absence test.

Fecal Coliforms were present in the Presence/Absence test in the July distribution system Site 2 water, Total Coliforms were detected by the membrane filtration test on the same sample. The District Officer was notified.

Aeromonas organisms were present in the March distribution system Site 3 water.

Standard Plate Count is a test used to supplement routine analysis for Coliform bacteria. The limit for Standard Plate Count (at 35°C after 48 hours) in the ODWO is 500 organisms/mL based on a geometric mean of 5 or more samples. High Standard Plate Counts were present in both the distribution system waters for the August sampling.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of water. Routine bacteriological testing as outlined in the ODWO is carried out by the operating authority. Water from the Fort Erie Water Treatment Plant, in terms of the limited DWSP bacteriological examination, was of good quality.

Inorganic and Physical Parameters

Laboratory and Field Chemistry

The results for Laboratory and Field Chemistry scans were below any applicable health related ODWOs.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important health effect of Turbidity is its interference with disinfection in the treatment plant and maintenance of a chlorine residual. The ODWO of 1 FTU is only applicable to treated water leaving the plant. The Fort Erie Water Treatment Plant had no Turbidity values in the treated

water that exceeded the ODWO.

There are ODWOs that are set for parameters which are related to the aesthetic quality rather than health; one of these is Organic Nitrogen. Organic Nitrogen values are calculated by subtracting the value for Ammonia (Ammonium Total) from the value for Total Kjeldahl Nitrogen (Nitrogen Tot Kjeld). The aesthetic ODWO of 0.15 mg/L was exceeded in many of the treated and distribution system samples. When Organic Nitrogen exceeds 0.15 mg/L in the treated water some taste and odour problems can result.

This guideline is exceeded in most supplies. Based on the information obtained from the DWSP, which generally indicates no problems with this parameter exceedence, the guideline may be modified when the ODWOs are reviewed.

The aesthetic ODWO of 5 True Colour Units (TCU) was exceeded in two distribution system free flow water samples from Site 3. Colour in drinking water may be due to the presence of natural and synthetic organic substances as well as certain metallic ions.

It is desirable that the Temperature of drinking water be less than 15°C; the palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The desired ODWO was exceeded eight times in the free flow distribution waters at Site 1 and Site 2.

Metals

The results reported for the Metal scan were below any applicable ODWOs.

Elevated levels of Copper and Zinc were detected in the standing samples from the distribution system as compared to the free flow samples thus, indicating that these metals were leached from the household plumbing as the water stood overnight.

At present, there is no evidence that Aluminum is physiologically harmful and no limit has been specified. The measure of residual aluminum in the treated water is important to indicate efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 0.1 mg/L as Al in the water leaving the plant. Aluminum values exceeded the ODWO operational guideline on many occasions in the treated and distributed waters.

Organic Parameters

Chloroaromatics

Results of the Chloroaromatics scan showed that two parameters were detected:

1,2,3-Trichlorobenzene

Hexachloroethane

1,2,3-Trichlorobenzene was detected at a trace level, once in the distribution system Site 1 water.

Hexachloroethane was detected at trace levels, once in the treated water, once in the distribution system Site 1 water and once in the Site 3 water.

Review of these results, along with information from other water supplies on DWSP, would indicate that certain Chloroaromatics appear more frequently in the treated water than in the raw and almost always only at trace levels. These occurrences could possibly be due to a reaction of chlorine with organics present in the water or the distribution system.

Chlorophenols

Results of the Chlorophenol scan showed that no Chlorophenols were detected.

Pesticides and PCB (Polychlorinated Biphenyl)

Results of the Pesticide and PCB scan showed that one pesticide was detected:

Alpha BHC

Lindane consists of several isomers of BHC (Benzene Hexachloride). Alpha BHC is the isomer predominantly found in the Great Lakes basin as indicated in results from other water supplies on DWSP.

Alpha BHC was detected at trace levels, three times in the raw water, twice in the treated water, twice in the distribution system Site 1 water and once in the Site 3 water.

Specific Pesticides

Results of the Specific Pesticide scan showed that two parameters were detected:

Atrazine

Bladex

Atrazine was detected at a trace level, once in the distribution system Site 1 water.

Bladex was detected at a trace level, once in the distribution system Site 1 water.

Phenolics

Phenolics were detected, at trace levels, once in the raw water and once in the treated water. Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes.

Polynuclear Aromatic Hydrocarbons (PAH)

Results of the PAH scan showed that no PAHs were detected.

Volatiles

Results of the Volatile scan showed that three parameters, other than Trihalomethanes (THMs), were detected:

Benzene
Toluene
Ethylbenzene

Benzene was detected at a trace level, once in the raw water. A positive value detected in the December Distribution system Site 1 water was considered by the Laboratory analysts as unreliable due to contamination as per the remark 'UCR'.

Toluene was detected at trace levels, once in the raw water, once in the treated water and twice in the distribution system Site 1 water. A positive value detected for the December treated water sample was considered by the Laboratory analysts as unreliable due to contamination as per the remark 'UCR'.

Ethylbenzene was detected at a trace level, once in the raw water.

These volatiles are typically found on an occasional basis at other water supplies included on the DWSP usually at trace levels.

THMs are known to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised mainly of Chloroform, Chlorodibromomethane and Dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Chlorodibromomethane, Dichlorobromomethane and Total THMs were detected in all treated waters. Bromoform was detected at trace levels, twice in the treated water and distribution system Site 3 water and once in the Site 1 water. A positive value was found in the February Site 1 water and Site 3 water. All THM occurrences were well below the ODWO of 350 ug/L for Total THMs.

CONCLUSIONS

The Fort Erie water treatment plant for the sample year of 1987 produced good quality water at the plant and this was maintained throughout the distribution system.

No health related guidelines, for organic or inorganic parameters, were exceeded during 1987.

RECOMMENDATIONS

Two recommendations can be made:

- 1) The data base should be reviewed in consultation with Regional, Plant and DWSP personnel to determine if sampling location, sampling frequency and the number of parameters analysed should be revised to allow for a more efficient characterization of the water.

2) The reason for elevated Aluminum levels in treated water samples should be investigated.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SAMPLE DAY CONDITIONS			TREATMENT CHEMICAL DOSAGES (MG/L)				
DATE	RETENTION TIME(HRS)	FLOW (1000 M3)	PRE-CHLORINATION	COAGULATION		POST-CHLORINATION	TASTE & ODOUR
			CHLORINE	ALUM LIQUID	POLY ALUMINUM CHLORIDE	CHLORINE	ACTIVATED CARBON POWDER
FEB 24	.0	12.8	.70	6.00	1.80	.25	.
MAR 24	.0	13.1	.65	6.00	.	.20	.
JUL 13	18.0	32.0	1.60	7.50	.	.50	2.00
AUG 10	24.0	14.0	1.80	4.50	.	.60	3.00
SEP 08	12.0	14.0	1.70	4.50	.	.45	3.00
OCT 06	22.5	16.0	1.50	4.00	.	.40	.
NOV 03	23.5	14.0	1.00	2.00	.	.30	.
DEC 08	.0	14.0	.80	.	1.00	.30	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
BACTERIOLOGICAL	AEROMONAS SP	.	.	.	.	.	.	.	.	.	1	0	0	1	1	0
	COLIFORM	.	.	.	.	.	.	.	.	.	1	1	0	1	0	0
	E. COLI (P/A)	.	.	.	.	.	.	.	.	.	1	0	0	1	0	0
	FECAL COLIFORM	.	.	.	.	.	.	.	.	.	1	1	0	1	0	0
	FECAL COLIFORM MF	5	3	0	.	.	.	.	.	.	.	.	.	.	.	.
	P/A BOTTLE	.	.	.	6	0	0	9	0	0	3	1	0	2	1	0
	STANDRD PLATE CNT MF	5	5	0	6	3	0	9	7	0	3	3	0	2	2	0
	STAPH AUREUS	.	.	.	.	.	.	.	.	.	1	0	0	1	0	0
	T COLIFORM BCKGRD MF	5	5	0	6	2	0	9	5	0	3	2	0	2	0	0
	TOTAL COLIFORM MF	5	4	0	6	1	0	9	0	0	3	1	0	2	0	0
*TOTAL SCAN BACTERIOLOGICAL		20	17	0	24	6	0	36	12	0	17	9	0	13	4	0
*TOTAL GROUP BACTERIOLOGICAL		20	17	0	24	6	0	36	12	0	17	9	0	13	4	0
CHEMISTRY (FLD)	FLD CHLORINE (COMB)	.	.	.	6	6	0	6	6	0	3	3	0	.	.	.
	FLD CHLORINE FREE	.	.	.	6	6	0	15	15	0	6	6	0	.	.	.
	FLD PH	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	FLD TURBIDITY	5	5	0	6	6	0	2	2	0	4	4	0	.	.	.
	TEMPERATURE	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	TOTAL CHLORINE	.	.	.	6	6	0	17	17	0	2	2	0	.	.	.
*TOTAL SCAN CHEMISTRY (FLD)		15	15	0	36	36	0	74	74	0	27	27	0	8	8	0
CHEMISTRY (LAB)	ALKALINITY	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE														
		RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHEMISTRY (LAB)	AMMONIUM TOTAL	5	4	1	6	0	6	17	9	6	6	1	5	4	0	4
	CALCIUM	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	CHLORIDE	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	COLOUR	5	1	4	6	0	5	17	5	12	6	5	1	4	4	0
	CONDUCTIVITY	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	CYANIDE	5	0	0	6	0	0	8	0	0	3	0	0	1	0	0
	FLUORIDE	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	HARDNESS	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	MAGNESIUM	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	NITRITE	5	0	5	6	1	3	17	1	13	6	0	6	4	0	4
	NITROGEN TOT KJELD	5	5	0	6	6	0	17	17	0	6	6	0	4	3	1
	PH	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	PHOSPHORUS FIL REACT	5	2	2	6	0	4	.	.	.	.	.	.	.	.	.
	PHOSPHORUS TTL-UNFIL	5	2	3	6	1	5	.	.	.	.	.	.	.	.	.
	RESIDUE (TOTAL)	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	SODIUM	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
	TOTAL NITRATES	5	2	3	6	3	2	17	15	2	6	4	2	4	4	0
	TURBIDITY	5	5	0	6	6	0	17	17	0	6	6	0	4	4	0
*TOTAL SCAN CHEMISTRY (LAB)		95	71	18	114	77	25	280	234	33	99	82	14	65	55	9
METALS	ALUMINUM	5	5	0	5	5	0	15	15	0	6	6	0	4	4	0
	ARSENIC	5	0	0	6	0	0	16	0	0	6	0	0	4	0	0
	BARIUM	5	5	0	5	5	0	15	15	0	6	6	0	4	4	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE			RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS	BERYLLIUM	5	0	0	5	0	0	15	0	0	6	0	0	4	0	0			
	BORON	5	0	5	6	0	6	16	6	10	6	0	6	4	4	0			
	CADMIUM	5	0	0	5	0	0	15	0	0	6	0	0	4	0	0			
	CHROMIUM	5	2	0	5	3	0	15	3	0	6	1	0	4	0	0			
	COBALT	5	1	0	5	1	0	15	0	0	6	0	0	4	0	0			
	COPPER	5	4	0	5	3	0	15	15	0	6	6	0	4	4	0			
	CYANIDE	.	.	.	.	.	.	1	0	0	.	.	.	1	0	0			
	IRON	5	5	0	5	2	0	15	15	0	6	6	0	4	4	0			
	LEAD	5	1	0	5	1	0	15	6	0	6	1	0	4	2	0			
	MANGANESE	5	5	0	5	3	0	15	15	0	6	6	0	4	4	0			
	MERCURY	5	1	0	6	4	0	9	9	0	3	0	0	2	1	0			
	MOLYBDENUM	5	4	0	5	4	0	15	9	0	6	4	0	4	0	0			
	NICKEL	5	2	0	5	4	0	15	5	0	6	1	0	4	1	0			
	SELENIUM	5	0	0	6	0	0	16	0	0	6	0	0	4	0	0			
	STRONTIUM	5	5	0	5	5	0	15	15	0	6	6	0	4	4	0			
	URANIUM	5	5	0	6	6	0	16	14	0	6	6	0	4	3	0			
	VANADIUM	5	0	0	5	0	0	15	1	0	6	1	0	4	0	0			
	ZINC	5	2	0	5	2	0	15	13	0	6	6	0	4	4	0			
*TOTAL SCAN METALS		100	47	5	105	48	6	299	156	10	117	56	6	79	39	0			
*TOTAL GROUP INORGANIC & PHYSICAL		210	133	23	255	161	31	653	464	43	243	165	20	152	102	9			
CHLOROAROMATICS	123 TRICHLOROBENZENE	5	0	0	4	0	0	7	0	1	2	0	0	2	0	0			
	1234 T-CHLOROBENZENE	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0			

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

[illegible]

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE			RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
PAH	ANTHRACENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	BENZO(A)ANTHRACENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	BENZO (A) PYRENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	BENZO(B) CHRYSENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	BENZO(B) FLUORANTHENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	BENZO(E)PYRENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	BENZO(G,H,I) PERYLENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	BENZO(J) FLUORANTHENE	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	BENZO(K) FLUORANTHENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	CHRYSENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	CORONENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	DIBENZO(A,H) ANTHRACENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	DIMETH. BENZ(A)ANTHRACENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	FLUORANTHENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	INDENO(1,2,3-C,D) PYRENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	PERYLENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	PHENANTHRENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
	PYRENE	2	0	0	2	0	0	.	.	.	.	.	.	.	.	.	.	.	.
*TOTAL SCAN PAH		34	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PESTICIDES & PCB	ALACHLOR	5	0	0	6	0	0	9	0	0	3	0	0	2	0	0			
	ALDRIN	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0			
	ALPHA BHC	5	0	3	4	0	2	7	0	2	2	0	0	2	0	1			

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE														
		RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PESTICIDES & PCB	ALPHA CHLORDANE	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	ATRATONE	5	0	0	6	0	0	9	0	0	3	0	0	2	0	0
	BETA BHC	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	DIELDRIN	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	ENDRIN	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	ETHYLENE DIBROMIDE	5	0	0	6	0	0	7	0	0	3	0	0	1	0	0
	GAMMA CHLORDANE	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	HCB	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	HEPTACHLOR	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	HEPTACHLOR EPOXIDE	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	LINDANE	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	METHOXYCHLOR	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	MIREX	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	OPDDT	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	OXYCHLORDANE	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	PCB	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	PP-DDD	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	PPDDE	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	PPDDT	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	THIODAN I	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	THIODAN II	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
	THIODAN SULPHATE	5	0	0	4	0	0	7	0	0	2	0	0	2	0	0
*TOTAL SCAN PESTICIDES & PCB		125	0	3	106	0	2	179	0	2	53	0	0	49	0	1

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE						SITE 1			SITE 2			SITE 3		
		RAW			TREATED			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
SPECIFIC PESTICIDES	IPC	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	MALATHION	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	METHYL PARATHION	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	METHYLTRITHION	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	METOLACHLOR	5	0	0	6	0	0	9	0	0	3	0	0	2	0	0
	MEVINPHOS	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	PARATHION	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	PHORATE	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	PICHLORAM	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	PROMETONE	5	0	0	6	0	0	9	0	0	3	0	0	2	0	0
	PROMETRYNE	5	0	0	6	0	0	9	0	0	3	0	0	2	0	0
	PROPAZINE	5	0	0	6	0	0	9	0	0	3	0	0	2	0	0
	PROPOXUR	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	RELDAN	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	RONNEL	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	SENCOR	5	0	0	6	0	0	9	0	0	3	0	0	2	0	0
	SEVIN	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	SILVEX	1	0	0	1	0	0	.	.	.	.	.	.	.	.	.
	SIMAZINE	5	0	0	6	0	0	9	0	0	3	0	0	2	0	0
	SUTAN	0	0	0	0	0	0	.	.	.	.	.	.	.	.	.
	TOXAPHENE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*TOTAL SCAN SPECIFIC PESTICIDES		63	0	0	72	0	0	81	0	2	27	0	0	18	0	0
VOLATILES	1,1 DICHLOROETHANE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE			RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
VOLATILES	1,1 DICHLOROETHYLENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	1,2 DICHLOROBENZENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	1,2 DICHLOROETHANE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	1,2 DICHLOROPROPANE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	1,3 DICHLOROBENZENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	1,4 DICHLOROBENZENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	111, TRICHLOROETHANE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	112 TRICHLOROETHANE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	1122 T-CHLOROETHANE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	BENZENE	5	0	1	6	0	0	8	1	0	3	0	0	2	0	0			
	BROMOFORM	5	0	0	6	0	2	8	1	2	3	0	0	2	1	0			
	CARBON TETRACHLORIDE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	CHLOROBENZENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	CHLORODIBROMOMETHANE	5	0	0	6	6	0	8	8	0	3	3	0	2	2	0			
	CHLOROFORM	5	0	0	6	6	0	8	8	0	3	3	0	2	2	0			
	DICHLOROBROMOMETHANE	5	0	0	6	6	0	8	8	0	3	3	0	2	2	0			
	DICHLOROMETHANE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	ETHYLBENZENE	5	0	1	6	0	0	8	0	0	3	0	0	2	0	0			
	ETHYLENE DIBROMIDE	.	.	.	.	.	.	1	0	0	.	.	.	1	0	0			
	M-XYLENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	O-XYLENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	P-XYLENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	T-CHLOROETHYLENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	T1,2DICHLOROETHYLENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	TOLUENE	5	0	1	6	1	1	8	0	2	3	0	0	2	0	0			

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	SITE			RAW			TREATED			SITE 1			SITE 2			SITE 3		
		TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE			TOTAL POSITIVE TRACE		
VOLATILES	TOTL TRIHALOMETHANES	5	0	0	6	6	0	8	8	0	3	3	0	2	2	0			
	TRICHLOROETHYLENE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
	TRIFLUOROCHLOROTOLUE	5	0	0	6	0	0	8	0	0	3	0	0	2	0	0			
*TOTAL SCAN VOLATILES		140	0	3	168	25	3	225	34	4	84	12	0	57	9	0			
*TOTAL GROUP ORGANIC		438	0	7	444	25	7	576	34	10	190	12	0	150	9	2			
TOTAL		668	150	30	723	192	38	1265	510	53	450	186	20	315	115	11			

KEY TO TABLES 5 AND 6

- A ONTARIO DRINKING WATER OBJECTIVES
1. Maximum Acceptable Concentration (MAC)
 - 1+. MAC for Total Trihalomethanes
 - 1*. MAC for Bacteriological Analyses
- Poor water quality is indicated when :
- total coliform counts $> 0 < 5$
 - P/A Bottle Test is present after 48 hours
 - Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
 - Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
 - Standard Plate Count should not exceed 500 organisms per ml at 35 deg C within 48 hours
2. Interim Maximum Acceptable Concentration (IMAC)
 3. Maximum Desirable Concentration (MDC)
 4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness > 200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.
- B HEALTH & WELFARE CANADA
1. Maximum Acceptable Concentration (MAC)
 2. Proposed MAC
 3. Interim MAC
- C WORLD HEALTH ORGANIZATION
1. Guideline Value (GV)
 2. Tentative GV
 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
 2. Suggested No-Adverse Effect Level (SNAEL)
 3. Lifetime Health Advisory
 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
 2. Aesthetic Guideline Level
 3. Maximum Admissible Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- H USSR MAXIMUM PERMISSIBLE CONCENTRATION
- I NEW YORK STATE AMBIENT WATER GUIDELINE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample

RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
RAW	TREATED	SITE 1		SITE 2		SITE 3	
		STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>							
BACTERIOLOGICAL							
AEROMONAS SP (0=ABSENT)		DET'N LIMIT = N/A		GUIDELINE = 0		(A1)	
MAR	.	.	.	.	.	.	1
JUL	.	.	.	.	0	.	.
<hr/>							
E. COLI (P/A) (0=ABSENT)		DET'N LIMIT = N/A		GUIDELINE =			
MAR	.	.	.	.	.	.	0
JUL	.	.	.	.	0	.	.
<hr/>							
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 0		(A1)	
JUL	4	.	.	.	.	.	.
AUG	31	.	.	.	.	.	.
SEP	0	.	.	.	.	.	.
OCT	2	.	.	.	.	.	.
NOV	0	.	.	.	.	.	.
<hr/>							
FECAL COLIFORM (0=ABSENT)		DET'N LIMIT = N/A		GUIDELINE = 0		(A1)	
MAR	.	.	.	.	.	.	0
JUL	.	.	.	.	1	.	.
<hr/>							
STANDRD PLATE CNT MF (CT/ML)		DET'N LIMIT = 0		GUIDELINE = 500/ML		(A1)	
FEB	.	.	2	.	.	.	3
MAR	.	.	28	.	.	.	22

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUN	.	.	.	320	.	.	.	.
JUL	90	12	.	155	.	160	.	.
AUG	600	3	.	770	.	1240	.	.
SEP	420	0	.	480	.	57	.	.
OCT	800	5	.	24	.	.	.	.
NOV	15	0	.	0	.	.	.	.
DEC	.	0	.	0	.	.	.	.

P/A BOTTLE (0=ABSENT)			DET'N LIMIT = 0		GUIDELINE = 0		(A1*)	
FEB	.	.	.	0	.	.	.	0
MAR	.	.	.	0	.	.	.	1
JUN	.	.	.	0	.	.	.	.
JUL	.	0	.	0	.	1	.	.
AUG	.	0	.	0	.	0	.	.
SEP	.	0	.	0	.	0	.	.
OCT	.	0	.	0	.	.	.	.
NOV	.	0	.	0	.	.	.	.
DEC	.	0	.	0	.	.	.	.

STAPH AUREUS (0=ABSENT)			DET'N LIMIT = N/A		GUIDELINE = 0		(A1)	
MAR	.	.	.	.	.	.	.	0
JUL	.	.	.	.	.	0	.	.

COLIFORM (0=ABSENT)			DET'N LIMIT = N/A		GUIDELINE = 0 (A1)			
MAR	.	.	.	.	.	.	.	0

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

JUL

1

TOTAL COLIFORM MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = 5/100ML(A1)

FEB	.	.	.	0	.	.	.	0
MAR	.	.	.	0	.	.	.	0
JUN	.	.	.	0	.	.	.	0
JUL	19 A3C	0	.	0	.	4 A3C	.	.
AUG	700	0	.	0	.	0	.	.
SEP	BDL	0	.	0	.	0	.	.
OCT	38 A3C	0	.	0	.	.	.	.
NOV	1	1	.	0	.	.	.	.
DEC	.	0	.	0	.	.	.	.

T COLIFORM BCKGRD MF (CT/100ML)

DET'N LIMIT = 0

GUIDELINE = N/A

FEB	.	.	.	0	.	.	.	0
MAR	.	.	.	1	.	.	.	0
JUN	.	.	.	2	.	.	.	0
JUL	2400 >	0	.	17	.	2400 >	.	.
AUG	10000	0	.	235	.	510	.	.
SEP	31000	0	.	41	.	0	.	.
OCT	2800	0	.	0	.	.	.	.
NOV	81	20	.	0	.	.	.	.
DEC	.	1	.	0	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM				
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

CHEMISTRY (FLD)								
FLD CHLORINE (COMB) (MG/L)		DET'N LIMIT = N/A		GUIDELINE =		N/A		
MAR100	.	.	.	.
JUL	.	.120	.200	.	.	.	.	.
AUG	.	.130	.200	.	.100	.100	.	.
SEP	.	.100	.300	.200	.080	.	.	.
OCT	.	.140	.	.	.	.	.	.
NOV	.	.220	.200	.	.	.	.	.
DEC	.	.110	.	.	.	.	.	.

FLD CHLORINE FREE (MG/L)		DET'N LIMIT = N/A		GUIDELINE =		N/A		
FEB	.	.	.300	.300	.	.	.	.
MAR	.	.	.100	.	.	.	.	.
JUN	.	.	.300	.300	.	.	.	.
JUL	.	.280	.100	.300	.100	.100	.	.
AUG	.	.390	.100	.300	.100	.300	.	.
SEP	.	.370	.	.100	.100	.100	.	.
OCT	.	.400	.100	.300	.	.	.	.
NOV	.	.230	.100	.300	.	.	.	.
DEC	.	.490	.	.100	.	.	.	.

TOTAL CHLORINE (MG/L)		DET'N LIMIT = N/A		GUIDELINE =		N/A		
FEB	.	.	.300	.300	.	.	.	.
MAR	.	.	.100	.100	.	.	.	.
JUN	.	.	.300	.300	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

JUL	.	.430	.300	.300	.	.	.	.
AUG	.	.520	.300	.300	.200	.400	.	.
SEP	.	.470	.300	.300	.	.	.	.
OCT	.	.540	.100	.300	.	.	.	.
NOV	.	.450	.300	.300	.	.	.	.
DEC	.	.600	.	.100	.	.	.	.

FLD PH (DMSNLESS)

DET'N LIMIT = N/A

GUIDELINE = 6.5-8.5 (A4)

FEB	.	.	7.600	7.400	.	.	7.600	7.600
MAR	.	.	7.200	7.400	.	.	7.400	7.400
JUN	.	.	7.400	7.400	.	.	.	.
JUL	8.100	7.600	7.800	7.000	7.800	7.900	.	.
AUG	8.100	7.500	7.600	7.400	7.800	7.600	.	.
SEP	8.000	7.800	7.800	8.000	8.000	7.800	.	.
OCT	7.900	7.600	7.600	7.400	.	.	.	.
NOV	8.200	7.800	7.800	7.400	.	.	.	.
DEC	.	7.800	.	7.600	.	.	.	.

TEMPERATURE (DEG.C)

DET'N LIMIT = N/A

GUIDELINE = N/A

FEB	.	.	12.000	5.000	.	.	6.500	5.000
MAR	.	.	10.500	5.500	.	.	9.000	6.000
JUN	.	.	17.500	16.000	.	.	.	.
JUL	21.900	21.900	21.500	20.000	21.000	20.000	.	.
AUG	22.900	22.900	21.500	21.000	20.000	21.500	.	.
SEP	20.100	20.100	21.000	20.000	23.000	20.500	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
OCT	14.500	14.500	18.500	17.900	.	.	.	.
NOV	10.000	10.000	17.100	13.100	.	.	.	.
DEC	.	5.000	.	8.100	.	.	.	.
FLD TURBIDITY (FTU)	DET'N LIMIT = N/A		GUIDELINE = 1.0 (A1)					
JUN	.	.	.690	.550	.	.	.	.
JUL	1.100	.260	.	.	.210	.210	.	.
AUG	1.500	.240	.	.	.290	.290	.	.
SEP	.900	.320	.	.	.	.	.	.
OCT	4.900	.290	.	.	.	.	.	.
NOV	1.600	.480	.	.	.	.	.	.
DEC	.	.300	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

CHEMISTRY (LAB)								
ALKALINITY (MG/L)			DET'N LIMIT = .200		GUIDELINE = 30-500 (A4)			
FEB	.	.	106.500	109.700	.	.	108.100	107.200
MAR	.	.	101.800	102.300	.	.	102.700	102.500
JUN	.	.	98.000	98.300	.	.	.	.
JUL	99.800	94.400	93.500	94.000	95.400	97.600	.	.
AUG	101.600	90.800	93.100	93.300	94.300	93.100	.	.
SEP	100.100	95.000	96.200	95.500	96.000	96.000	.	.
OCT	102.400	99.600	98.100	98.200	.	.	.	.
NOV	102.600	98.600	95.000	99.600	.	.	.	.
DEC	.	103.300	.	103.600	.	.	.	.

CALCIUM (MG/L)			DET'N LIMIT = .100		GUIDELINE = 100. (F2)			
FEB	.	.	40.800	40.400	.	.	41.800	42.200
MAR	.	.	39.700	39.800	.	.	40.300	40.700
JUN	.	.	37.200	37.400	.	.	.	.
JUL	36.000	36.400	36.800	37.000	37.800	37.000	.	.
AUG	35.400	36.200	36.200	36.400	35.000	36.400	.	.
SEP	36.400	36.000	37.000	36.600	37.200	37.000	.	.
OCT	36.800	37.200	37.200	36.400	.	.	.	.
NOV	38.600	35.400	37.600	38.000	.	.	.	.
DEC	.	38.600	.	38.200	.	.	.	.

CHLORIDE (MG/L)			DET'N LIMIT = .200		GUIDELINE = 250.0 (A3)			
FEB	.	.	17.500	17.500	.	.	17.500	17.500

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM				
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.	.	16.500	16.500	.	.	16.500	16.500
JUN	.	.	17.000	17.000	.	.	.	.
JUL	14.500	16.500	19.500	16.500	16.500	16.500	.	.
AUG	15.000	17.000	17.500	17.000	17.500	17.000	.	.
SEP	15.000	17.000	17.000	17.000	17.000	17.000	.	.
OCT	15.500	17.000	17.000	17.000	.	.	.	.
NOV	14.800	16.200	16.300	16.200	.	.	.	.
DEC	.	16.400	.	16.300	.	.	.	.

COLOUR (TCU)			DET'N LIMIT = .5		GUIDELINE = 5.0 (A3)			
FEB	.	.	5.500	3.500	.	.	6.500	6.500
MAR	.	.	3.000	3.500	.	.	6.000	6.000
JUN	.	.	2.000 <T	1.500 <T	.	.	.	.
JUL	1.000 <T	BDL	2.000 <T	1.500 <T	4.000	4.000	.	.
AUG	2.000 <T	.500 <T	2.000 <T	2.000 <T	3.500	4.000	.	.
SEP	2.000 <T	.500 <T	2.000 <T	2.000 <T	2.500	2.000 <T	.	.
OCT	2.000 <T	.500 <T	2.000 <T	2.500	.	.	.	.
NOV	4.500	1.500 <T	1.000 <T	1.500 <T	.	.	.	.
DEC	.	1.000 <T	.	1.000 <T	.	.	.	.

CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1		GUIDELINE = 400. (F2)			
FEB	.	.	304	304	.	.	309	306
MAR	.	.	309	309	.	.	310	309
JUN	.	.	299	297	.	.	.	.
JUL	286	292	292	291	292	291	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>								
AUG	282	286	291	289	289	284	.	.
SEP	286	291	295	290	292	291	.	.
OCT	295	300	296	295	.	.	.	.
NOV	284	289	297	292	.	.	.	.
DEC	.	296	.	296	.	.	.	.
<hr/>								
FLUORIDE (MG/L)			DET'N LIMIT = .01		GUIDELINE = 2.400 (A1)			
FEB	.	.	.140	.140	.	.	.130	.130
MAR	.	.	.130	.130	.	.	.120	.120
JUN	.	.	.140	.120	.	.	.	.
JUL	.080	.080	.080	.080	.080	.100	.	.
AUG	.120	.120	.110	.110	.100	.100	.	.
SEP	.100	.100	.100	.120	.100	.100	.	.
OCT	.120	.100	.100	.100	.	.	.	.
NOV	.120	.120	.120	.120	.	.	.	.
DEC	.	.100	.	.100	.	.	.	.
<hr/>								
HARDNESS (MG/L)			DET'N LIMIT = .500		GUIDELINE = 80-100 (A4)			
FEB	.	.	138.500	137.500	.	.	139.500	141.500
MAR	.	.	135.500	134.500	.	.	135.000	136.500
JUN	.	.	128.000	128.000	.	.	.	.
JUL	124.000	125.000	125.000	126.000	128.000	125.000	.	.
AUG	129.000	126.000	119.000	127.000	121.000	125.000	.	.
SEP	126.000	126.000	128.000	126.000	129.000	127.000	.	.
OCT	127.000	129.500	128.000	127.000	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
NOV	132.000	123.000	130.000	131.000	.	.	.	.
DEC	.	132.000	.	131.000	.	.	.	.

MAGNESIUM (MG/L)	DET'N LIMIT = .050		GUIDELINE = 30. (F2)					
FEB	.	.	8.900	8.900	.	.	8.600	8.800
MAR	.	.	8.900	8.500	.	.	8.300	8.400
JUN	.	.	8.500	8.300	.	.	.	.
JUL	8.300	8.300	7.900	8.300	8.100	8.000	.	.
AUG	9.800	8.600	7.000	8.800	8.100	8.400	.	.
SEP	8.500	8.700	8.500	8.600	8.700	8.400	.	.
OCT	8.600	8.900	8.600	8.700	.	.	.	.
NOV	8.600	8.400	8.700	8.700	.	.	.	.
DEC	.	8.700	.	8.600	.	.	.	.

SODIUM (MG/L)	DET'N LIMIT = .200		GUIDELINE = 200. (C3)					
FEB	.	.	9.100	9.400	.	.	9.500	9.400
MAR	.	.	9.100	9.200	.	.	9.100	9.100
JUN	.	.	8.400	8.400	.	.	.	.
JUL	8.400	8.200	8.800	8.200	8.400	8.200	.	.
AUG	8.600	8.600	9.000	8.600	8.600	8.800	.	.
SEP	9.200	9.400	9.400	9.200	9.400	9.400	.	.
OCT	9.000	9.400	8.800	8.800
NOV	8.600	8.400	8.800	8.600
DEC	.	7.800	.	8.000

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DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM				
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002		GUIDELINE = .05 (F2)			
FEB	.	.	.006 <T	.006 <T	.	.	.004 <T	.004 <T
MAR	.	.	.016	.008 <T	.	.	.004 <T	.006 <T
JUN	.	.	.114	.012	.	.	.	.
JUL	.046	.006 <T	.130	.006 <T	.064	.004 <T	.	.
AUG	.032	.006 <T	.176	.006 <T	.004 <T	.004 <T	.	.
SEP	.034	.002 <T	.222	.002 <T	.002 <T	.002 <T	.	.
OCT	.022	.002 <T	.096	BDL	.	.	.	.
NOV	.008 <T	.002 <T	.074	BDL	.	.	.	.
DEC	.	.008 <T	.	.010	.	.	.	.

NITRITE (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)			
FEB	.	.	.002 <T	.003 <T	.	.	.004 <T	.002 <T
MAR	.	.	.003 <T	.003 <T	.	.	.002 <T	.003 <T
JUN	.	.	.002 <T	.002 <T	.	.	.	.
JUL	.004 <T	.001 <T	.002 <T	.002 <T	.002 <T	.002 <T	.	.
AUG	.003 <T	.001 <T	.002 <T	.002 <T	.001 <T	.001 <T	.	.
SEP	.003 <T	.001 <T	.002 <T	.001 <T	.001 <T	.002 <T	.	.
OCT	.002 <T	BDL	BDL	.001 <T	.	.	.	.
NOV	.001 <T	BDL	BDL	BDL	.	.	.	.
DEC	.	.008	.	.008	.	.	.	.

TOTAL NITRATES (MG/L)			DET'N LIMIT = .020		GUIDELINE = 10.000 (A1)			
FEB	.	.	.285	.285	.	.	.320	.305
MAR	.	.	.280	.265	.	.	.280	.270

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DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUN	.	.	.335	.165	.	.	.	.
JUL	.095 <T	.100	.290	.100	.205	.130	.	.
AUG	.075 <T	.070 <T	.310	.065 <T	.100	.085 <T	.	.
SEP	.080 <T	.075 <T	.310	.085 <T	.105	.095 <T	.	.
OCT	.110	.125	.235	.120	.	.	.	.
NOV	.120	.130	1.460	.140	.	.	.	.
DEC	.	BDL	.	.235	.	.	.	.

NITROGEN TOT KJELD (MG/L)								
			DET'N LIMIT = .020		GUIDELINE =		N/A	
FEB	.	.	.120	.150	.	.	.190	.120
MAR	.	.	.210	.160	.	.	.140	.090 <T
JUN	.	.	.280	.140	.	.	.	.
JUL	.250	.140	.410	.170	.190	.170	.	.
AUG	.200	.160	.390	.120	.170	.160	.	.
SEP	.260	.180	.500	.130	.140	.120	.	.
OCT	.180	.120	.280	.100	.	.	.	.
NOV	.220	.160	.330	.170	.	.	.	.
DEC	.	.190	.	.210	.	.	.	.

PH (DMSNLESS)								
			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)			
FEB	.	.	8.120	8.090	.	.	8.130	8.120
MAR	.	.	8.080	8.080	.	.	8.100	8.110
JUN	.	.	8.250	8.240
JUL	8.460	8.090	8.100	8.100	8.130	8.200	.	.
AUG	8.330	8.130	8.170	8.190	8.230	8.150	.	.

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DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	8.370	8.140	8.100	8.150	8.190	8.190	.	.
OCT	8.310	8.250	8.210	8.230	.	.	.	.
NOV	8.330	8.170	7.960	8.140	.	.	.	.
DEC	.	8.180	.	8.140	.	.	.	.

PHOSPHORUS FIL REACT (MG/L)			DET'N LIMIT = .5UG/L		GUIDELINE =		N/A	
JUL	.002	.000 <T	.	.	.	.	.	.
AUG	.001 <T	.000 <T	.	.	.	.	.	.
SEP	BDL	BDL	.	.	.	.	.	.
OCT	.006	BDL	.	.	.	.	.	.
NOV	.000 <T	.001 <T	.	.	.	.	.	.
DEC	.	.000 <T	.	.	.	.	.	.

PHOSPHORUS TTL-UNFIL (MG/L)			DET'N LIMIT = .002		GUIDELINE = .40		(F2)	
JUL	.015	.004 <T	.	.	.	.	.	.
AUG	.009 <T	.003 <T	.	.	.	.	.	.
SEP	.009 <T	.003 <T	.	.	.	.	.	.
OCT	.052	.046	.	.	.	.	.	.
NOV	.009 <T	.004 <T	.	.	.	.	.	.
DEC	.	.006 <T	.	.	.	.	.	.

RESIDUE (TOTAL) (MG/L)			DET'N LIMIT = 1.		GUIDELINE = 500.		(A3)	
FEB	.	.	198 CRO	198 CRO	.	.	201 CRO	199 CRO
MAR	.	.	201 CRO	201 CRO	.	.	202 CRO	201 CRO

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DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
JUN	.	.	194 CRO	193 CRO	.	.	.	.
JUL	186 CRO	190 CRO	190 CRO	189 CRO	190 CRO	189 CRO	.	.
AUG	183 CRO	186 CRO	189 CRO	188 CRO	188 CRO	185 CRO	.	.
SEP	186 CRO	189 CRO	192 CRO	189 CRO	190 CRO	189 CRO	.	.
OCT	192 CRO	195 CRO	192 CRO	192 CRO	.	.	.	.
NOV	185 CRO	188 CRO	193 CRO	190 CRO	.	.	.	.
DEC	.	192 CRO	.	192 CRO	.	.	.	.
<hr/>								
TURBIDITY (FTU)	DET'N LIMIT = .02		GUIDELINE = 1.00 (A1)					
FEB	.	.	1.020	1.140	.	.	1.000	1.160
MAR	.	.	.470	.460	.	.	.840	.870
JUN	.	.	.480	.340	.	.	.	.
JUL	.880	.140	.370	.280	.690	.500	.	.
AUG	1.270	.260	.340	.340	.550	.490	.	.
SEP	.680	.190	.400	.240	.320	.230	.	.
OCT	6.900	.150	.280	.310
NOV	1.830	.180	.310	.210
DEC	.	.160	.	.120

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DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

METALS								
ALUMINUM (MG/L)			DET'N LIMIT = .004		GUIDELINE = .10 (A4)			
FEB	.	.	.048	.037	.	.	.028	.037
MAR	.	.	.048	.041	.	.	.044	.040
JUN	.	.	.110	.120	.	.	.	.
JUL	.010	.420	.240	.270	.180	.220	.	.
AUG	.044	.300	.250	.250	.230	.250	.	.
SEP	.048	.360	.250	.280	.220	.230	.	.
OCT	.090	.170	.130	.140	.	.	.	.
NOV	.052	.170	1BT	.160	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.

BARIUM (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)			
FEB	.	.	.023	.021	.	.	.021	.020
MAR	.	.	.011	.011	.	.	.018	.018
JUN	.	.	.014	.018	.	.	.	.
JUL	.021	.021	.022	.021	.022	.022	.	.
AUG	.019	.019	.019	.019	.018	.019	.	.
SEP	.020	.020	.019	.020	.021	.020	.	.
OCT	.018	.017	.017	.015	.	.	.	.
NOV	.016	.016	1BT	.016
DEC	.	ISM	.	ISM

BORON (MG/L)			DET'N LIMIT = 0.01		GUIDELINE = 5.000 (A1)			
FEB	.	.	.030	.020	.	.	.030	.030

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DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.	.	.030	.030	.	.	.020	.030
JUN	.	.	.020	.040	.	.	.	.
JUL	.020 <T	.020 <T	.020 <T	.010 <T	.010 <T	.010 <T	.	.
AUG	.020 <T	.020 <T	.030 <T	.020 <T	.020 <T	.010 <T	.	.
SEP	.030 <T	.020 <T	.030 <T	.020 <T	.020 <T	.020 <T	.	.
OCT	.020 <T	.020 <T	.020 <T	.010 <T	.	.	.	.
NOV	.020 <T	.020 <T	1BT	.020 <T	.	.	.	.
DEC	.	.032 <T	.	.036 <T	.	.	.	.

COBALT (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = 1.0 (H)			
FEB	.	.	BDL	BDL	.	.	BDL	BDL
MAR	.	.	BDL	BDL	.	.	BDL	BDL
JUN	.	.	BDL	BDL	.	.	.	.
JUL	BDL	BDL	BDL	BDL	BDL	BDL	.	.
AUG	.001	.001	BDL	BDL	BDL	BDL	.	.
SEP	BDL	BDL	BDL	BDL	BDL	BDL	.	.
OCT	BDL	BDL	BDL	BDL	.	.	.	.
NOV	BDL	BDL	1BT	BDL	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.

CHROMIUM (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = .05 (A1)			
FEB	.	.	BDL	BDL	.	.	BDL	BDL
MAR	.	.	BDL	BDL	.	.	BDL	BDL
JUN	.	.	BDL	BDL
JUL	BDL	.001	BDL	BDL	.001	BDL	.	.

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DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AUG	BDL	BDL	BDL	BDL	BDL	BDL	.	.
SEP	BDL	BDL	BDL	BDL	BDL	BDL	.	.
OCT	.002	.001	.002	.001	.	.	.	.
NOV	.001	.001	IBT	.002	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.
<hr/>								
COPPER (MG/L)	DET'N LIMIT = .001		GUIDELINE = 1.0 (A3)					
FEB	.	.	.033	.004	.	.	.021	.008
MAR	.	.	.030	.003	.	.	.028	.008
JUN	.	.	.024	.004	.	.	.	.
JUL	.001	.001	.036	.005	.045	.010	.	.
AUG	.001	BDL	.028	.006	.044	.007	.	.
SEP	.001	.001	.020	.005	.043	.008	.	.
OCT	.001	.002	.025	.005	.	.	.	.
NOV	BDL	BDL	IBT	.004	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.
<hr/>								
IRON (MG/L)	DET'N LIMIT = .002		GUIDELINE = .300 (A3)					
FEB	.	.	.180	.120	.	.	.190	.240
MAR	.	.	.090	.078	.	.	.180	.160
JUN	.	.	.170	.095	.	.	.	.
JUL	.032	BDL	.057	.095	.210	.170	.	.
AUG	.019	BDL	.090	.085	.100	.140	.	.
SEP	.028	BDL	.057	.078	.080	.056	.	.
OCT	.098	.007	.068	.069

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SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
NOV	.046	.003	IBT	.034	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.
<hr/>								
MERCURY (UG/L)	DET'N LIMIT = 0.010		GUIDELINE = 1.000 (A1)					
FEB	.	.	.	.040	.	.	.	.040
MAR	.	.	.	.270	.	.	.	BDL
JUN	.	.	.	.010	.	.	.	.
JUL	BDL	BDL	.	.010	.	BDL	.	.
AUG	BDL	.010	.	.010	.	BDL	.	.
SEP	BDL	.010	.	.010	.	BDL	.	.
OCT	.010	BDL	.	.010	.	.	.	.
NOV	BDL	.010	.	.010	.	.	.	.
DEC	.	.010	.	.020	.	.	.	.
<hr/>								
MANGANESE (MG/L)	DET'N LIMIT = .001		GUIDELINE = .050 (A3)					
FEB	.	.	.010	.008	.	.	.002	.002
MAR	.	.	.006	.005	.	.	.002	.002
JUN	.	.	.007	.007	.	.	.	.
JUL	.005	.001	.015	.007	.003	.003	.	.
AUG	.006	BDL	.012	.011	.002	.003	.	.
SEP	.005	BDL	.007	.009	.002	.002	.	.
OCT	.008	.001	.011	.009	.	.	.	.
NOV	.004	.001	IBT	.003	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM				
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

MOLYBDENUM (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = .50 (H)			
FEB	.	.	BDL	BDL	.	.	BDL	BDL
MAR	.	.	.001	.001	.	.	BDL	BDL
JUN	.	.	BDL	.001	.	.	.	.
JUL	.001	.001	.001	.001	.001	.001	.	.
AUG	.001	.001	.001	.001	.001	BDL	.	.
SEP	.001	.001	BDL	.001	BDL	.001	.	.
OCT	BDL	BDL	BDL	BDL	.	.	.	.
NOV	.001	.001	!BT	.001	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.

NICKEL (MG/L)			DET'N LIMIT = 0.001		GUIDELINE = .05 (F3)			
FEB	.	.	BDL	BDL	.	.	BDL	BDL
MAR	.	.	BDL	BDL	.	.	.002	BDL
JUN	.	.	BDL	BDL	.	.	.	.
JUL	BDL	BDL	BDL	BDL	.002	BDL	.	.
AUG	BDL	.002	.002	BDL	BDL	BDL	.	.
SEP	BDL	.002	.002	BDL	BDL	BDL	.	.
OCT	.002	.002	.003	.001	.	.	.	.
NOV	.001	.001	!BT	.001	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.

LEAD (MG/L)			DET'N LIMIT = 0.003		GUIDELINE = .050 (A1)			
FEB	.	.	BDL	BDL	.	.	BDL	BDL
MAR	.	.	.007	.005	.	.	.004	.006

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
TYPE			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>								
JUN	.	.	.006	.005	.	.	.	.
JUL	BDL	BDL	BDL	BDL	BDL	BDL	.	.
AUG	.009	.008	.011	.009	.007	BDL	.	.
SEP	BDL	BDL	BDL	BDL	BDL	BDL	.	.
OCT	BDL	BDL	BDL	BDL	.	.	.	.
NOV	BDL	BDL	IBT	BDL	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.
<hr/>								
STRONTIUM (MG/L)			DET'N LIMIT = .001		GUIDELINE = 2.00 (H)			
FEB	.	.	.190	.170	.	.	.190	.190
MAR	.	.	.100	.110	.	.	.160	.160
JUN	.	.	.110	.140	.	.	.	.
JUL	.160	.160	.160	.150	.160	.170	.	.
AUG	.150	.150	.150	.150	.160	.160	.	.
SEP	.150	.150	.150	.160	.170	.160	.	.
OCT	.150	.150	.140	.150	.	.	.	.
NOV	.140	.140	IBT	.140	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.
<hr/>								
URANIUM (UG/L)			DET'N LIMIT = .02		GUIDELINE = 20. (A2)			
FEB	.	.	.290	.290	.	.	.260	.260
MAR	.	.	BDL	BDL	.	.	BDL	.230
JUN	.	.	.010	.010	.	.	.	.
JUL	.310	.320	.300	.300	.280	.280	.	.
AUG	.290	.260	.270	.280	.280	.300	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
SEP	.410	.420	.400	.400	.360	.380	.	.
OCT	.400	.370	.320	.360	.	.	.	.
NOV	.390	.430	1BT	.430	.	.	.	.
DEC	.	.380	.	.370	.	.	.	.
<hr/>								
VANADIUM (MG/L)	DET'N LIMIT = .001		GUIDELINE = .10 (H)					
FEB	.	.	BDL	BDL	.	.	BDL	BDL
MAR	.	.	BDL	BDL	.	.	BDL	BDL
JUN	.	.	BDL	BDL	.	.	.	.
JUL	BDL	BDL	BDL	BDL	.001	BDL	.	.
AUG	BDL	BDL	BDL	BDL	BDL	BDL	.	.
SEP	BDL	BDL	BDL	BDL	BDL	BDL	.	.
OCT	BDL	BDL	.002	BDL	.	.	.	.
NOV	BDL	BDL	1BT	BDL	.	.	.	.
DEC	.	ISM	.	ISM	.	.	.	.
<hr/>								
ZINC (MG/L)	DET'N LIMIT = .001		GUIDELINE = 5.00 (A3)					
FEB	.	.	.010	.004	.	.	.008	.002
MAR	.	.	.011	.006	.	.	.007	.002
JUN	.	.	.010	BDL	.	.	.	.
JUL	BDL	BDL	.008	.001	.038	.007	.	.
AUG	.006	.010	.032	.025	.066	.004	.	.
SEP	BDL	BDL	.007	BDL	.040	.002	.	.
OCT	.003	.003	.012	.003	.	.	.	.
NOV	BDL	BDL	1BT	.004	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
DEC	.	ISM	.	ISM	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
CHLOROAROMATICS								
123 TRICHLOROBENZENE (NG/L)			DET'N LIMIT = 5.000		GUIDELINE = 10000. (1)			
FEB	.	.	.	BDL	.	.	.	BDL
MAR	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	13.000 <T	.	.	.	.
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	BDL	BDL	.	ILA	.	ISM	.	.
SEP	BDL	BDL	.	BDL	.	BDL	.	.
OCT	BDL	IIS	.	BDL	.	.	.	.
NOV	BDL	BDL	.	BDL	.	.	.	.
DEC	.	IIS	.	IIS	.	.	.	.
HEXACHLOROETHANE (NG/L)								
			DET'N LIMIT = 1.000		GUIDELINE = 1900. (D4)			
FEB	.	.	.	BDL	.	.	.	BDL
MAR	.	.	.	8.000 <T	.	.	.	10.000 <T
JUN	.	.	.	BDL	.	.	.	.
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	BDL	1.000 <T	.	ILA	.	ISM	.	.
SEP	BDL	BDL	.	BDL	.	BDL	.	.
OCT	BDL	IIS	.	BDL	.	.	.	.
NOV	BDL	BDL	.	BDL	.	.	.	.
DEC	.	IIS	.	IIS	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

PESTICIDES & PCB								
ALPHA BHC (NG/L)	DET'N LIMIT = 1.000		GUIDELINE = 700. (G)					
FEB	.	.	.	BDL	.	.	.	BDL
MAR	.	.	.	2.000 <T	.	.	.	2.000 <T
JUN	.	.	.	2.000 <T	.	.	.	.
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	1.000 <T	1.000 <T	.	1LA	.	ISM	.	.
SEP	1.000 <T	BDL	.	BDL	.	BDL	.	.
OCT	1.000 <T	1IS	.	BDL	.	.	.	.
NOV	BDL	1.000 <T	.	BDL	.	.	.	.
DEC	.	1IS	.	1IS	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>								
PHENOLICS								
PHENOL (UG/L)	DET'N LIMIT = 0.2		GUIDELINE = 2.00 (A3)					
JUL	.200 <T	.200 <T	.	.	.	.	.	.
AUG	BDL	BDL	.	.	.	.	.	.
SEP	BDL	BDL	.	.	.	.	.	.
OCT	BDL	BDL	.	.	.	.	.	.
NOV	BDL	BDL	.	.	.	.	.	.
DEC	.	BDL	.	.	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
TYPE			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

SPECIFIC PESTICIDES								
ATRAZINE (NG/L)			DET'N LIMIT = 50.00		GUIDELINE = 60000. (B3)			
FEB	.	.	.	80.000 <T	.	.	.	BDL
MAR	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	BDL	BDL	.	BDL	.	BDL	.	.
SEP	BDL	BDL	.	BDL	.	BDL	.	.
OCT	BDL	BDL	.	BDL	.	.	.	.
NOV	BDL	BDL	.	BDL	.	.	.	.
DEC	.	BDL	.	BDL	.	.	.	.

BLADEX (NG/L)			DET'N LIMIT = 100.00		GUIDELINE = 10000. (B3)			
FEB	.	.	.	BDL	.	.	.	BDL
MAR	.	.	.	130.000 <T	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	BDL
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	BDL	BDL	.	BDL	.	BDL	.	.
SEP	BDL	BDL	.	BDL	.	BDL	.	.
OCT	BDL	BDL	.	BDL	.	.	.	.
NOV	BDL	BDL	.	BDL	.	.	.	.
DEC	.	BDL	.	BDL	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM				
SITE	RAW	TREATED	SITE 1	SITE 2		SITE 3		
TYPE			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW

VOLATILES								
BENZENE (UG/L)			DET'N LIMIT = 0	GUIDELINE = 5.0	(D1)			
FEB	.	.	.	BDL	.	.	.	BDL
MAR	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	.
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	BDL	BDL	.	BDL	.	BDL	.	.
SEP	BDL	BDL	.	ISM	.	BDL	.	.
OCT	BDL	BDL	.	BDL	.	.	.	.
NOV	.050 <T	BDL	.	BDL	.	.	.	.
DEC	.	BDL	.	.050 UCS	.	.	.	.

TOLUENE (UG/L)			DET'N LIMIT = 0	GUIDELINE = 100.0	(G)			
FEB	.	.	.	BDL	.	.	.	BDL
MAR	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	.450 <T	.	.	.	.
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	BDL	BDL	.	BDL	.	BDL	.	.
SEP	BDL	BDL	.	ISM	.	BDL	.	.
OCT	BDL	BDL	.	BDL	.	.	.	.
NOV	.250 <T	.150 <T	.	.150 <T	.	.	.	.
DEC	.	.050 UCS	.	BDL	.	.	.	.

ETHYLBENZENE (UG/L)			DET'N LIMIT = 0	GUIDELINE = 3400.	(D3)			
FEB	.	.	.	BDL	.	.	.	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
MAR	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	.
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	BDL	BDL	.	BDL	.	BDL	.	.
SEP	BDL	BDL	.	ISM	.	BDL	.	.
OCT	BDL	BDL	.	BDL	.	.	.	.
NOV	.150 <T	BDL	.	BDL	.	.	.	.
DEC	.	BDL	.	BDL	.	.	.	.
CHLOROFORM (UG/L)								
			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)			
FEB	.	.	.	11.000	.	.	.	11.000
MAR	.	.	.	11.000	.	.	.	11.000
JUN	.	.	.	16.500	.	.	.	.
JUL	BDL	28.000	.	18.000	.	17.000	.	.
AUG	BDL	25.600	.	19.700	.	19.900	.	.
SEP	BDL	22.600	.	ISM	.	18.500	.	.
OCT	BDL	24.100	.	18.900	.	.	.	.
NOV	BDL	20.200	.	15.200	.	.	.	.
DEC	.	22.500	.	12.100	.	.	.	.
DICHLOROBROMOMETHANE (UG/L)								
			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)			
FEB	.	.	.	8.000	.	.	.	8.000
MAR	.	.	.	7.000	.	.	.	7.000
JUN	.	.	.	8.500	.	.	.	.
JUL	BDL	14.000	.	10.000	.	9.000	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

WATER TREATMENT PLANT			DISTRIBUTION SYSTEM					
SITE TYPE	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
AUG	BDL	12.900	.	10.600	.	9.700	.	.
SEP	BDL	12.100	.	ISM	.	9.900	.	.
OCT	BDL	11.500	.	9.900	.	.	.	.
NOV	BDL	10.800	.	8.900	.	.	.	.
DEC	.	13.500	.	8.600	.	.	.	.
CHLORODIBROMOMETHANE (UG/L)								
			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)			
FEB	.	.	.	4.000	.	.	.	4.000
MAR	.	.	.	4.000	.	.	.	3.000
JUN	.	.	.	4.000	.	.	.	.
JUL	BDL	6.000	.	4.000	.	4.000	.	.
AUG	BDL	5.100	.	4.400	.	4.000	.	.
SEP	BDL	4.600	.	ISM	.	3.800	.	.
OCT	BDL	4.800	.	4.300	.	.	.	.
NOV	BDL	4.200	.	3.600	.	.	.	.
DEC	.	5.100	.	3.500	.	.	.	.
BROMOFORM (UG/L)								
			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)			
FEB	.	.	.	1.000	.	.	.	1.000
MAR	.	.	.	BDL	.	.	.	BDL
JUN	.	.	.	BDL	.	.	.	.
JUL	BDL	BDL	.	BDL	.	BDL	.	.
AUG	BDL	BDL	.	BDL	.	BDL	.	.
SEP	BDL	BDL	.	ISM	.	BDL	.	.
OCT	BDL	.200 <T	.	.200 <T	.	.	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

SITE TYPE	WATER TREATMENT PLANT		DISTRIBUTION SYSTEM					
	RAW	TREATED	SITE 1		SITE 2		SITE 3	
			STANDING	FREE FLOW	STANDING	FREE FLOW	STANDING	FREE FLOW
NOV	BDL	.200 <T	.	.200 <T	.	.	.	.
DEC	.	BDL	.	BDL	.	.	.	.

TOTL TRIHALOMETHANES (UG/L)			DET'N LIMIT = 0		GUIDELINE = 350.0 (A1)			
FEB	.	.	.	24.000	.	.	.	24.000
MAR	.	.	.	22.000	.	.	.	21.000
JUN	.	.	.	29.000	.	.	.	.
JUL	BDL	48.000	.	32.000	.	30.000	.	.
AUG	BDL	43.600	.	34.700	.	33.600	.	.
SEP	BDL	39.300	.	ISM	.	32.200	.	.
OCT	BDL	40.600	.	33.300	.	.	.	.
NOV	BDL	35.400	.	27.900	.	.	.	.
DEC	.	41.100	.	24.200	.	.	.	.

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN ----	PARAMETER -----	ANALYSED -----	DETECTION LIMIT -----	GUIDELINE -----
CHEMISTRY (LAB)	CYANIDE	25	0.001	.200 (A1) MG/L
METALS	ARSENIC	38	0.001	.050 (A1) MG/L
	BERYLLIUM	38	0.001	.0002 (H) MG/L
	CYANIDE	25	0.001	.200 (A1) MG/L
	CADMIUM	38	0.300	5.000 (A1) UG/L
	SELENIUM	38	0.001	.010 (A1) MG/L
CHLOROAROMATICS	HEXACHLOROBUTADIENE	25	1.000	450. (D4) NG/L
	1234 T-CHLOROBENZENE	25	1.000	10000. (I) NG/L
	1235 T-CHLOROBENZENE	25	1.000	10000. (I) NG/L
	124 TRICHLOROBENZENE	25	5.000	10000. (I) NG/L
	1245 T-CHLOROBENZENE	25	1.000	38000. (D4) NG/L
	135 TRICHLOROBENZENE	25	5.000	10000. (D4) NG/L
	OCTACHLOROSTYRENE	25	1.000	N/A NG/L
	PENTACHLOROBENZENE	25	1.000	74000. (D4) NG/L
	236 TRICHLOROTOLUENE	25	5.000	N/A NG/L
	245 TRICHLOROTOLUENE	25	5.000	N/A NG/L
	26A TRICHLOROTOLUENE	25	5.000	N/A NG/L
CHLOROPHENOLS	234 TRICHLOROPHENOL	2	50.	N/A NG/L
	2345 T-CHLOROPHENOL	2	50.	N/A NG/L
	2356 T-CHLOROPHENOL	2	50.	N/A NG/L
	245-TRICHLOROPHENOL	2	50.	2600000(D4) NG/L
	246-TRICHLOROPHENOL	2	50.	10000. (C1) NG/L
	PENTACHLOROPHENOL	2	50.	10000. (C1) NG/L
PAH	PHENANTHRENE	5	0	N/A NG/L
	ANTHRACENE	5	0	N/A NG/L
	FLUORANTHENE	5	0	42000 (D4) NG/L
	PYRENE	5	0	N/A NG/L
	BENZO(A)ANTHRACENE	5	0	N/A NG/L
	CHRYSENE	5	0	N/A NG/L
	DIMETH. BENZ(A)ANTHR	5	0	N/A NG/L
	BENZO(E)PYRENE	5	0	N/A NG/L
	BENZO(J) FLUORANTHEN	5	N/A	N/A NG/L
	BENZO(B) FLUORANTHEN	5	0	N/A NG/L
	PERYLENE	5	0	N/A NG/L
	BENZO(K) FLUORANTHEN	5	N/A	N/A NG/L
	BENZO (A) PYRENE	5	0	10 (B1) NG/L
	BENZO(G,H,I) PERYLEN	5	0	N/A NG/L
	DIBENZO(A,H) ANTHRAC	5	0	N/A NG/L
	INDENO(1,2,3-C,D) PY	5	0	N/A NG/L
	BENZO(B) CHRYSENE	5	0	N/A NG/L
	ANTHANTHRENE	5	N/A	N/A NG/L
	COROWENE	5	0	N/A NG/L
PESTICIDES & PCB	ALDRIN	25	1.000	700.0 (A1) NG/L
	BETA BHC	25	1.000	300. (G) NG/L
	LINDANE	25	1.000	4000.0 (A1) NG/L
	ALPHA CHLORDANE	25	2.000	7000.0 (A1) NG/L

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN	PARAMETER	ANALYSED	DETECTION LIMIT	GUIDELINE
-----	-----	-----	-----	-----
PESTICIDES & PCB	GAMMA CHLORDANE	25	2.000	7000.0 (A1) NG/L
	DIELDRIN	25	2.000	700.0 (A1) NG/L
	METHOXYCHLOR	25	5.000	100000. (A1) NG/L
	THIODAN I	25	2.000	74000. (D4) NG/L
	THIODAN II	25	4.000	74000. (D4) NG/L
	ENDRIN	25	4.000	200.0 (A1) NG/L
	THIODAN SULPHATE	25	4.000	N/A NG/L
	HEPTACHLOR EPOXIDE	25	1.000	3000.0 (A1) NG/L
	HEPTACHLOR	25	1.000	3000.0 (A1) NG/L
	MIREX	25	5.000	N/A NG/L
	OXYCHLORDANE	25	2.000	N/A NG/L
	OPDDT	25	5.000	30000. (A1) NG/L
	PCB	25	20.000	3000. (A2) NG/L
	PP-DDD	25	5.000	N/A NG/L
	PPDE	25	1.000	30000. (A1) NG/L
	PPDDT	25	5.000	30000. (A1) NG/L
	ATRATONE	25	50.	N/A NG/L
	ALACHLOR	25	500.	35000. (D2) NG/L
	ETHYLENE DIBROMIDE	25	0	50.0 (G) UG/L
	HCB	25	1.000	10.0 (C1) NG/L
SPECIFIC PESTICIDES	TOXAPHENE	25	N/A	5000. (A1) NG/L
	AMETRYNE	25	50.00	300000. (D3) NG/L
	PROMETONE	25	50.00	52500. (D3) NG/L
	PROPAZINE	25	50.00	16000. (D2) NG/L
	PROMETRYNE	25	50.00	1000. (B3) NG/L
	SENCOR	25	100.00	80000. (B2) NG/L
	SIMAZINE	25	50.00	10000. (B3) NG/L
	2,4,5-T	2	50.00	35000. (D2) NG/L
	2,4-D	2	100.00	100000. (A1) NG/L
	2,4-DP	2	100.00	18000. (B3) NG/L
	2,4-DP	2	100.00	N/A NG/L
	DICAMBA	2	100.00	87000. (B3) NG/L
	PICHLORAM	2	100.00	2450000 (D3) NG/L
	SILVEX	2	50.00	10000. (A1) NG/L
	DIAZINON	2	20.	14000. (A1) NG/L
	DICHLOROVOS	2	20.	N/A NG/L
	DURSBAN	2	20.	N/A NG/L
	ETHION	2	20.	35000. (G) NG/L
	GUTHION	2	N/A	N/A NG/L
	MALATHION	2	20.	160000. (G) NG/L
	MEVINPHOS	2	20.	N/A NG/L
	METHYL PARATHION	2	50.	7000. (B3) NG/L
	METHYLTRITHION	2	20.	N/A NG/L
	PARATHION	2	20.	35000. (B1) NG/L
	PHORATE	2	20.	35.0 (D2) NG/L
	RELDAN	2	20.	N/A NG/L
	RONNEL	2	20.	N/A NG/L
	AMINOCARB	2	N/A	N/A NG/L
	BENOMYL	2	N/A	N/A NG/L
	BUX	2	2000.	N/A NG/L
	CARBOFURAN	2	2000.	18000. (D3) NG/L

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM FORT ERIE W.T.P. 1987

COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN	PARAMETER	ANALYSED	DETECTION LIMIT	GUIDELINE
----	-----	-----	-----	-----
SPECIFIC PESTICIDES	CIPC	2	2000.	350000. (G) NG/L
	DIALATE	2	2000.	30000. (H) NG/L
	EPTAM	2	2000.	N/A NG/L
	IPC	2	2000.	N/A NG/L
	PROPOXUR	2	2000.	90000. (G) NG/L
	SEVIN	2	200.	70000. (A1) NG/L
	SUTAN	2	2000.	245000. (D3) NG/L
	METOLACHLOR	25	500.	50000. (B3) NG/L
VOLATILES	P-XYLENE	25	0	620. (G) UG/L
	M-XYLENE	25	0	620. (G) UG/L
	O-XYLENE	25	0	620. (G) UG/L
	1,1 DICHLOROETHYLENE	25	0	7.0 (D1) UG/L
	DICHLOROMETHANE	25	0	1750. (D3) UG/L
	T1,2DICHLOROETHYLENE	25	0	350. (D3) UG/L
	1,1 DICHLOROETHANE	25	0	N/A UG/L
	111, TRICHLOROETHANE	25	0	200. (D1) UG/L
	1,2 DICHLOROETHANE	25	0	5.0 (D1) UG/L
	CARBON TETRACHLORIDE	25	0	5.0 (D1) UG/L
	1,2 DICHLOROPROPANE	25	0	10.0 (G) UG/L
	TRICHLOROETHYLENE	25	0	5.0 (D1) UG/L
	112 TRICHLOROETHANE	25	0	.60 (D4) UG/L
	T-CHLOROETHYLENE	25	0	10.0 (C2) UG/L
	1122 T-CHLOROETHANE	25	0	0.17 (D4) UG/L
	CHLOROBENZENE	25	0	1510. (D3) UG/L
	1,4 DICHLOROBENZENE	25	0	75.0 (D1) UG/L
	1,3 DICHLOROBENZENE	25	0	130. (G) UG/L
	1,2 DICHLOROBENZENE	25	0	130. (G) UG/L
	TRIFLUOROCHLOROTOLUE	25	0	N/A UG/L
	ETHYLENE DIBROMIDE	25	0	50.0 (G) UG/L

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality,
- a flagging mechanism for 'Objective' exceedence,
- a definition of contaminant levels and trends,
- a comprehensive background for remedial action,
- a framework for assessment of new contaminants,
- and an indication of treatment efficiency of plant processes.

Program

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario; currently 44 plants are being monitored. Water supply locations have been prioritized for surveillance, based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit. It is estimated that after 4 years of operation, the program will be monitoring 90 locations.

A major goal of the program is to collect valid water quality data, in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analysed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling in order to acquire complete plant process and distribution system details, and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of the raw (ambient water) and the treated water at the treatment plant, and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled.

Sampling is carried out by operational personnel who have been trained in the applicable procedures.

Comprehensive standardized procedures and Field Test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". All laboratory analyses are carried out by the MOE Laboratory Services Branch.

Data Reporting Mechanism

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP co-ordinator.

DWSP INPUTS AND OUTPUTS

The DWSP INPUTS and OUTPUTS are illustrated in Fig. 1.

PROGRAM INPUTS

PLANT AND DISTRIBUTION SYSTEM DESCRIPTION

The system description includes plant specific non-analytical information acquired through a questionnaire and initial plant visit. During the initial assessment of the plant and distribution system the questionnaire content is verified and

missing information added. It is intended that all data be kept current with scheduled annual updates.

The PLANT and DISTRIBUTION SYSTEM DESCRIPTION consists of the following seven components.

1. Process component inventory

All physical and chemical processes that the water is subjected to, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. Treatment chemicals

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. The chemical dosages applied on the day of sampling are recorded in DWSP.

3. Process control measurements

Documentation of in-plant monitoring of process parameters (turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. In-plant monitoring results are generally not retained in DWSP but are retained by the Water Treatment Plant.

4. Design flow and retention time

The hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. The maximum, minimum and average flow as well as a record of the flow rate on the day of sampling are recorded in DWSP.

5. Distribution system description

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. Sampling system

Each plant is assessed for its adequacy in terms of sampling of bacteriological, organic and inorganic parameters. The prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area;
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap), pump characteristics (model, type, capacity) and flow rate.

7. People

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate Ministry of Environment personnel associated with the plant.

FIELD DATA

The second major input to DWSP is field data.

Field data is collected at the plant and from the distribution system sites on the day of sampling. The field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling as well as monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analysed according to standardized DWSP protocols to allow for interplant comparison.

LABORATORY ANALYTICAL DATA

The third major input to DWSP is Laboratory Analytical Data.

Samples gathered from the raw, treated and distribution sampling sites are analyzed for approximately 160 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. The parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments parameters may be measured for in a "scan" producing some results for parameters that are not on the DWSP priority list but which may be of interest. The majority of the parameters are measured on a routine basis however, those that are technically more difficult and/or costly to analyse for are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change notation will be made and intercomparison data documented.

PARAMETER REFERENCE INFORMATION

The fourth major input to DWSP is Parameter Reference Information

This is a catalogue of information for each substance analysed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database.

An example is shown in fig. 2.

A written copy (hard version) of the Parameter Reference Information will be available in the near future and is a new and sophisticated enhancement to the DWSP.

PROGRAM OUTPUTS

There are four major program outputs, Query, Action Alert, Report Generation and the Annual Report.

QUERY

All DWSP information is easily accessed through the Query function, therefore anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

ACTION ALERTS

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the publication, Ontario Drinking Water Objectives (ISBN 0-7729-2725-1 revised 1983). This publication contains health-related Maximum Acceptable Concentrations for thirty substances. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedences at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, other agency guidelines which are documented in the Parameter Reference Information may be used. If these guidelines are exceeded the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

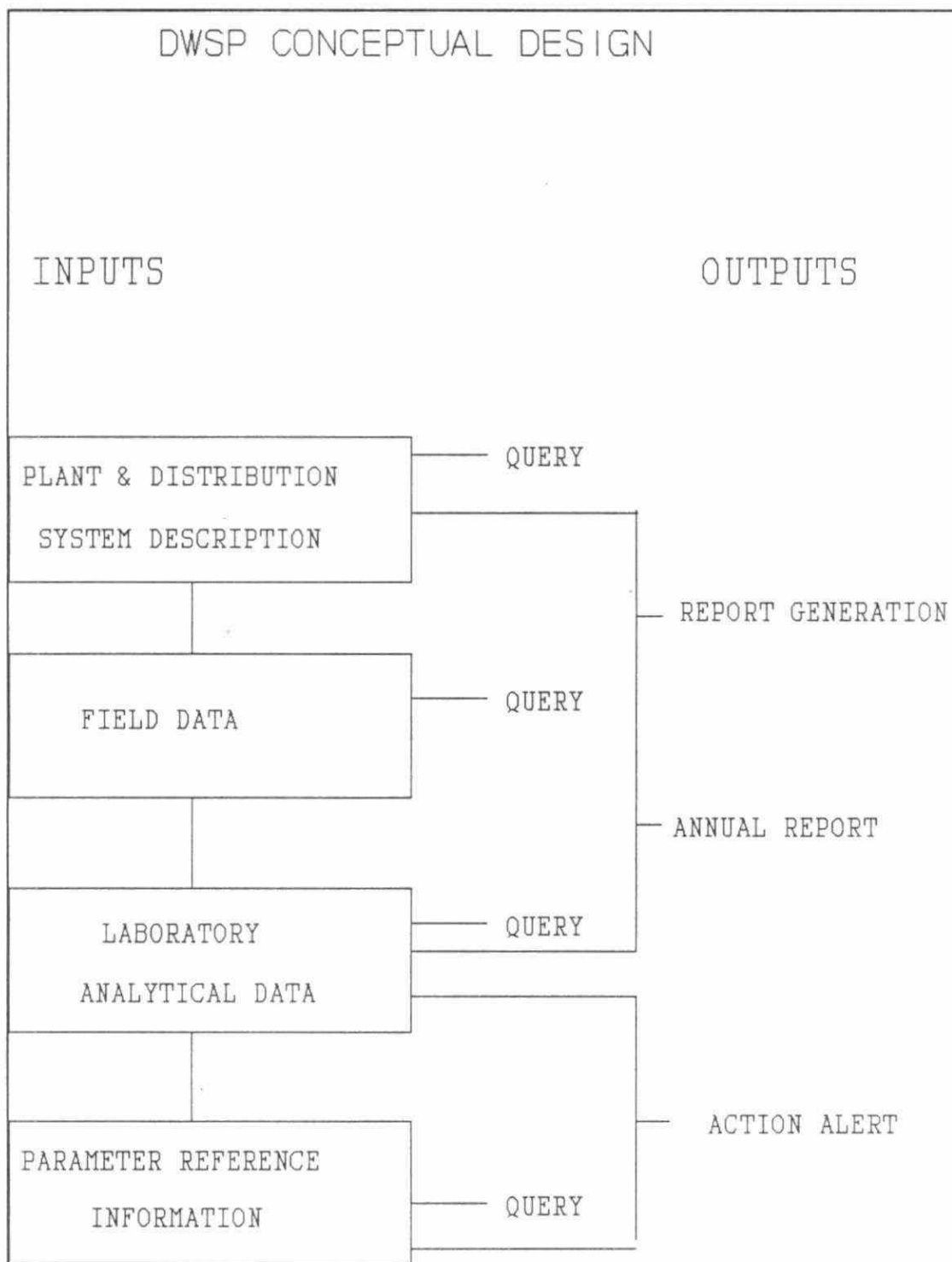
REPORT GENERATION

Custom reports can be generated from DWSP to meet the needs of the regions and to respond to public requests.

ANNUAL REPORTS

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG. 1



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FIG. 1

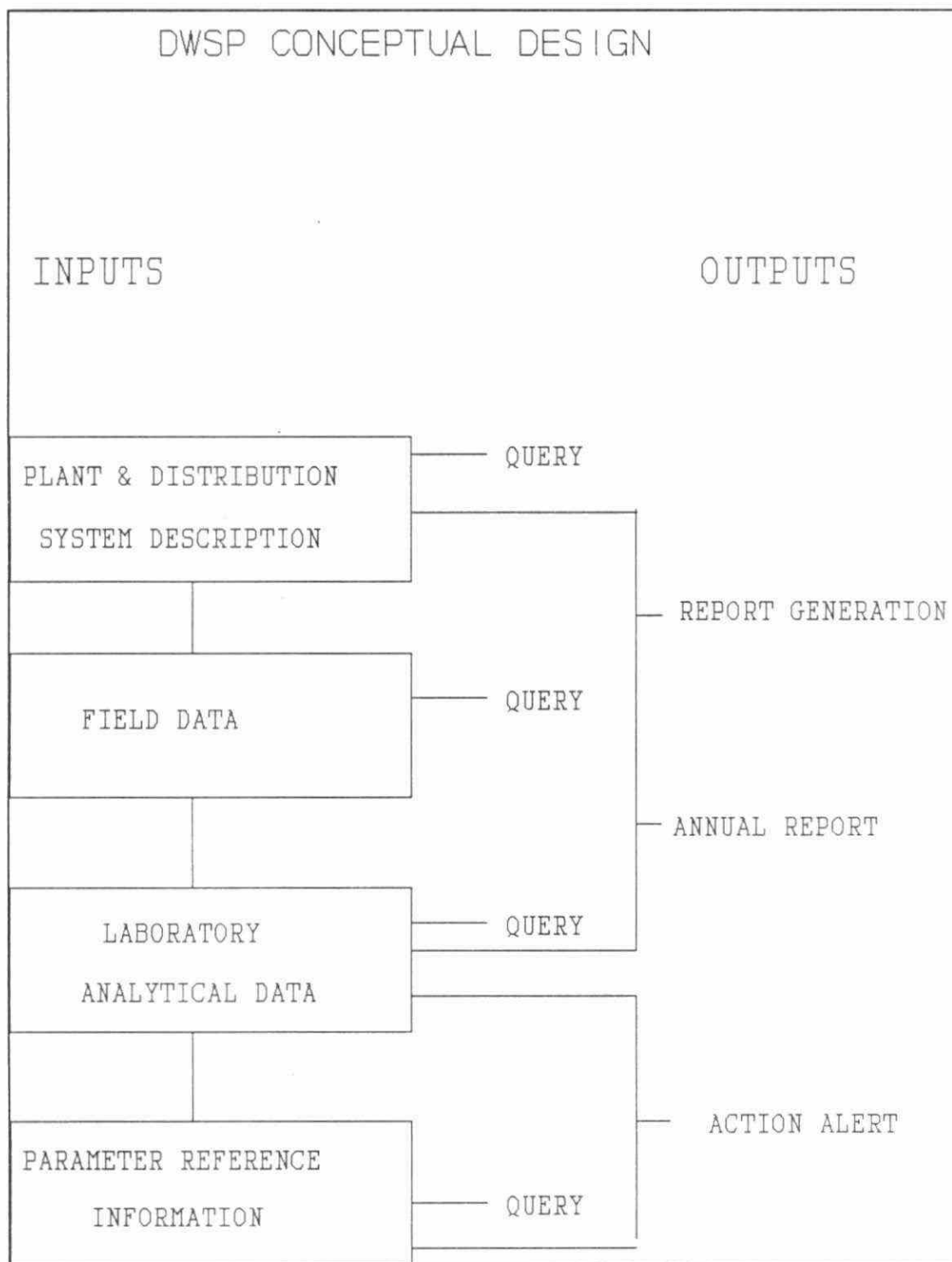


FIG.2

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

(B2001P)
REFERENCE
BENZENE

PARAMETER

SOURCE FROM	TO	METHOD	TARG	UNIT	NOTE
EPA C 86/04		NOMETH	.00	063000 UG/L	RMCL
EPAA C 80/11		NOMETH	6.60	063000 UG/L	
FERC C 84/05		NOMETH	1.00	063000 UG/L	
WHO C 84/01		NOMETH	10.00	064000 UG/L	

DESCRIPTION: NAME: BENZENE

CAS#: 71432

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 UG/L

SYNONYMS: BENZOLE, COAL NAPHTHA, CARBON OIL (27),
CYCLOHEXATRIENE (41)CHARACTERISTICS: COLOURLESS TO LIGHT YELLOW, MOBILE,
NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE,
AROMATIC, VAPOURS BURN WITH SMOKING FLAME (30)

PROPERTIES:

SOLUBILITY IN WATER: 1780-1800 MG/L AT 25 DEG C (41)

THRESHOLD ODOUR: NO DATA

THRESHOLD TASTE: 0.5 MG/L IN WATER (39)

ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING
ORGANISMS, APPEARS TO BIOACCUMULATE IN ANIMAL
TISSUES THAT EXHIBIT HIGH LIPID CONTENT OR ARE
MAJOR METABOLIC SITES (LIVER, BRAIN), SMALL
QUANTITIES EVAPORATE FROM SOIL OR DEGRADE QUICKLYSOURCES: PETROLEUM REFINING, SOLVENT RECOVERY, COAL
TAR DISTILLATION, FOOD PROCESSING, TANNING.USES: PREPARATION OF ETHYL BENZENE USED AS A STYRENE
MONOMER, DETERGENTS, NYLON, AS INTERMEDIATE INPESTICIDE PRODUCTION, SOLVENT IN RUBBER INDUSTRY,
DEGREASING AND CLEANSING AGENT, GASOLINE.TOXICITY: RATING 4 (VERY TOXIC); ACUTE - IRRITATES
MUCOUS MEMBRANES, SYMPTOMS INCLUDE RESTLESSNESS,
CONVULSIONS, DEPRESSION, RESPIRATORY FAILURE;

CHRONIC - ANEMIA AND LEUKEMIA (45).

CARINOGENICITY: HUMAN CARCINOGEN AND MUTAGEN

REMOVAL: GAC ADSORPTION, PRECIPITATION WITH ALUM
FOLLOWED BY SEDIMENTATION, COAGULATION AND
FLOCCULATION, SOLVENT EXTRACTION, OXIDATION (41).

MOLECULAR WEIGHT: 78.12 GRAMS

MELTING POINT: 5.5 DEGREES C (27)

BOILING POINT: 80.1 DEGREES C (27)

SPECIFIC GRAVITY: 0.879 AT 20 DEGREES C (27)

VAPOUR PRESSURE: 100 MM AT 26.1 DEGREES C

HENRY'S LAW CONSTANT: 0.00555 ATM M_2 /MOLELOG OCT./WATER PAR.COEFF: $K=1.0$ $1/N=1.6$ $R=.97$ $PH=5.3$

Appendix B

DWSP SAMPLING GUIDELINE

i) RAW and TREATED at PLANT

General Chemistry	<ul style="list-style-type: none">-500 mL clear plastic bottle-rinse bottle with sample three times and discard water-fill to line
Bacti	<ul style="list-style-type: none">-250 mL clear glass bottle with white seal on cap-do <u>not</u> rinse bottle; preservative has been added-avoid touching bottle neck or inside of cap-fill to top of red label as marked
Metals	<ul style="list-style-type: none">-500 mL clear plastic bottle with white lid-rinse bottle and cap three times, discard-fill to line-add 10 drops nitric acid(Caution: HNO_3 is corrosive)
Volatiles (OPOPUP)	<ul style="list-style-type: none">-250 mL clear glass bottle-do <u>not</u> rinse bottle-tilt bottle when filling-fill bottle completely; there should be no air bubbles.
Organic (OWOC), (OWTRI), (OAPAHX)	<ul style="list-style-type: none">-1 liter brown glass bottle per scan-do <u>not</u> rinse bottle-fill to approx. 1" from top-when 'special pesticides' are requested three extra bottles per sample must be submitted
Cyanide	<ul style="list-style-type: none">-500 mL clear plastic bottle-do <u>not</u> rinse bottle-fill to approx. 1" from top-add 10 drops sodium hydroxide(Caution: NaOH is corrosive)

Mercury

- 250 mL clear glass bottle
- rinse bottle and cap three times, discard then fill to top of label
- add 20 drops each nitric acid and potassium dichromate
- (**Caution:** HNO_3 and KCrO_7 corrosive)

Phenols

- 250 mL clear glass bottle
- do not rinse bottle
- fill to top of label as marked

Steps

1. Let cold water tap run for several minutes.
2. Record time in submission sheet.
3. Record teperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry

- 500 mL clear plastic bottle
- rinse bottle with sample three times and discard
- fill to line

Metals

- 500 mL clear plastic bottle with white lid
- rinse bottle and cap three times, discard
- fill to line
- add 10 drops nitric acid
(**Caution:** HNO_3 is corrosive)

Steps:

1. Record time on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL clear plastic bottle -rinse bottle with sample three times and discard water -fill to line
Bacti	-250 mL clear glass bottle with white seal on cap -do <u>not</u> rinse bottle; preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (Caution: HNO_3 is corrosive)
Volatiles (OPOPUP)	-250 mL clear glass bottle -do <u>not</u> rinse bottle; preservative has been added -tilt bottle when filling -fill bottle completely; there should be no air bubbles
Organic (OWOC), (OWTRI)	-1 liter brown glass bottle per scan -do <u>not</u> rinse bottle: preservative has been added -fill to approx. 1" from top
Cyanide	-500 mL clear plastic bottle -do <u>not</u> rinse bottle: preservative has been added -fill to approx. 1" from top -add 10 drops sodium hydroxide (Caution: NaOH is corrosive)
Mercury	-250 mL clear glass bottle -rinse bottle and cap three times, discard then fill to top of label -add 20 drops each nitric acid and potassium dichromate (Caution: HNO_3 and KCrO_7 corrosive)

Steps:

1. Record time on submission sheet.
2. Let cold water flow for ten minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

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1988**

Fort Erie water treatment plant :
annual report 1987.
79651